Methodology of organizational learning in risk management : Development of a collective memory for sanitary alerts

Wim van Wassenhove, Jean-Luc Wybo

METHODOLOGY OF ORGANIZATIONAL LEARNING IN RISK MANAGEMENT

Development of a collective memory for sanitary alerts

Wim VAN WASSENHOVE & Jean-Luc WYBO

Ecole des Mines de Paris[1]

Keywords

Experience reflection, food-related sanitary alert, collective memory

Abstract

In France, each Veterinary Central Department (VCD) is confronted with situations of food-related sanitary alerts occurring in its territory of responsibility. Management of those alerts often creates an interesting experience but the organization of the control is done in such a way that this experience is not shared outside this area. We present a method to capitalize and to share the experience obtained by the inspectors, based on the dynamics of the alert's management. Development of an alert is formalized as a succession of events and cycles of decision that constitute the base of actor's experience, which they use for management of new alerts. This set of cycles is going to constitute a support for formalization and capitalization of experience: a collective memory.

Introduction

Our society is nowadays regularly affected by food-related sanitary alerts and crisis. The population is expecting from the professionals and from the government that they reduce the risks and hazards to a minimum. For the professionals, there is a large economical importance. A food-related crisis that is rather badly managed by a company – mostly concerning the communication aspect - can cause, besides important financial damages, large damages for the image of the company. The economic consequences for a small and medium-sized enterprise (SME) in France that was at the origin of an epidemic of Listeriosis is estimated at 2 million $ [Cerisier 1998].

From this point of view, the management and the sharing of the knowledge obtained with an experience reflection of the food-related sanitary alerts and crisis constitutes a way for progress for the prevention and the management of those risks and hazards and for the formation of the actors of both the profession and the services of control.

Experience reflection

Collective learning is mainly based on debriefing, or what we call an *experience reflection* (ER) process. It's a post operational evaluation activity that is used to learn from incidents, accidents and crisis to reduce their occurrence. ER is composed of four phases: collect events, analyze events, learn lessons and apply new decisions [Colardelle 2000].

[1] Ecole des Mines de Paris – Pôle cindyniques, BP 207, F-06904 Sophia-Antipolis (France) – http://www.cindy.ensmp.fr

All actors that participated in accidents or in incidents have interesting experiences and those actors are more or less willing to share that experience. All experiences are useful for sharing: the good ones and the bad ones. Indeed, it's not only the worst accident that contains the most interesting experience.

Experience is obtained on two levels: in the day to day management and on certain occasions while managing an alert or crisis. In this paper, we are interested in the experience obtained while managing food-related alerts. Sharing of those experiences between actors needs a simple methodology and formalism, simple but adapted to their way of working and to their organization.

Experience reflection in the professional world: state of the art

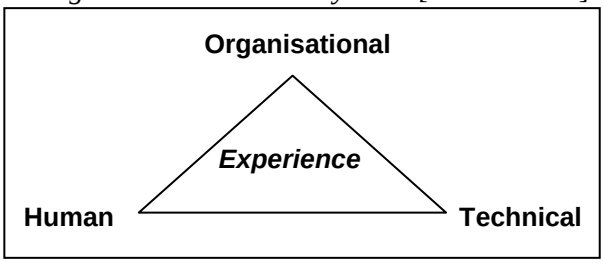
Gilbert [Gilbert 2001] has resumed very well the state of the art of debriefing or experience reflection in the professional world. His point of view is that an experience reflection generally is focused on the collecting, in a more or less automatic or standard way, of information on events which occur frequently and that can be treated within the organization. The approach is largely focused on technical problems and the goal is to constitute databases. This approach, focused on the technical aspect, is in line with the engineer's culture, a culture that rules largely in organizations that have the responsibility of hazard activities. This way of experience reflection tends to minimize the implications of the actors and the organization, to reduce the difficulties only to technical problems. The human and organizational aspects are almost not considered. This approach of experience reflection corresponds to the general approach in this domain.

Our approach tries to take into account the complexity of the systems to which it is applied, one of the reasons being that danger cannot be fully assessed in isolation.

The complexity of the system can be represented by the analysis of three subsystems:

- Human: employees of all activities
- Organizational: documents and procedures
- Technological: technical equipment and machinery

Figure 1: The three subsystems [Nicolet 1997]



Formalization of the experience

When we want to memorize the experience of accident's management, the method generally used consist in formalizing each accident as an elementary entity. This approach is commonly used with databases of accidents. This way of proceeding is useful for a statistical use of the accidents. On the counterpart, there is a major inconvenience of losing a lot of important information: the dynamics of accident's development, the different steps in decision making with the argumentation.

Most of the hazard situations change with time, caused by external conditions or by a succession of events and decisions. Each one of those key events is associated with a *decision cycle*. [Therrien 1998]. Thus, for the definition of the situation's evolution between two instants, we will use a

decision cycle, composed of four main aspects: *perception of the situation, analysis, action and effect*. This decision cycle represents the smallest element of experience that still holds onto his properties, that still renders information without distortion and hence preserves most of the complexity of the situation. We will name it "*particle of experience*".

A particle of experience is composed of four main aspects:

- Situation: what was happening at that particular moment in time (event and context),
- Decision: after analyzing the situation, what decisions concerning actions are taken,
- Action: what is the action taken,
- Effect: what is the effect of the action taken until the next key event.

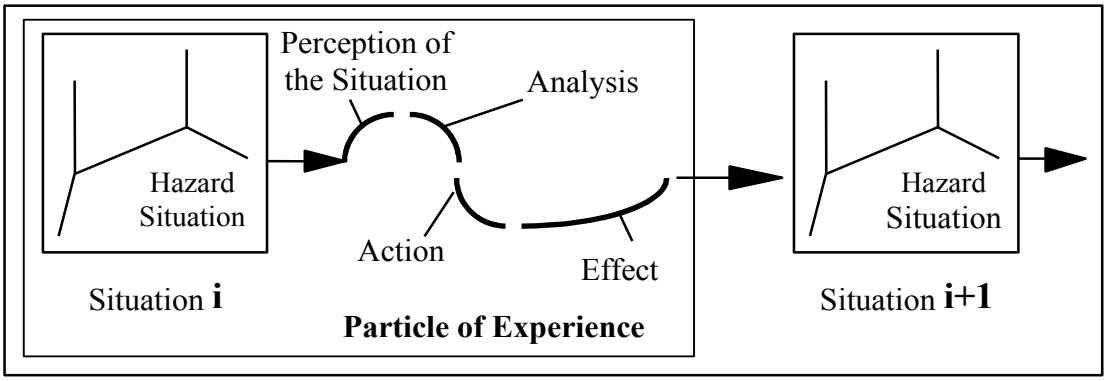


Figure 2: The decision cycle [Wybo 2001]

The hypothesis is that the key events with their representative decision cycles constitute the basis of the actor's experience. The experience that they reutilize for the management of new accidents.

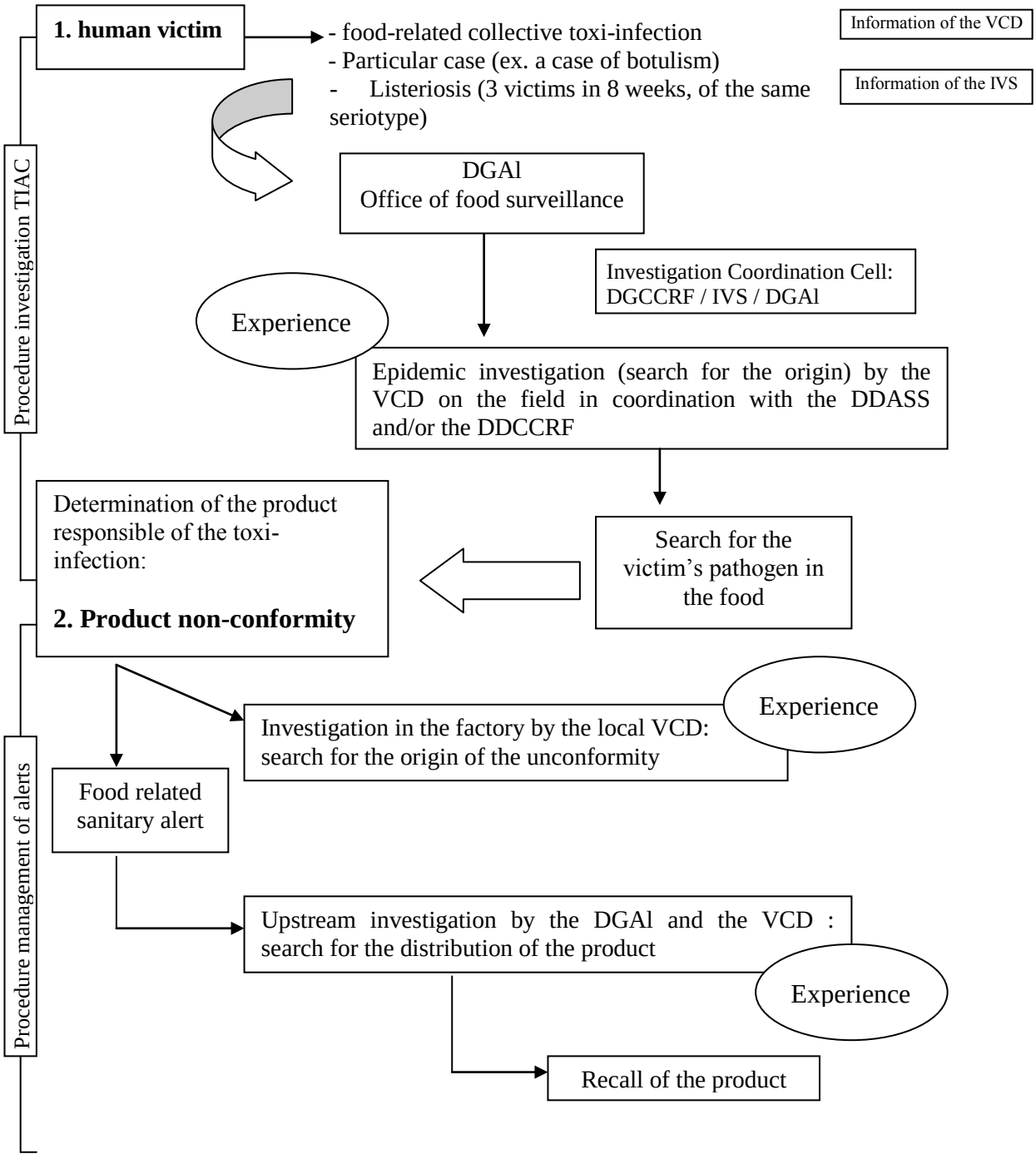
Proposing a model of the dynamics of an alert's management is only the first point; we have to define a method of collection of the experience that is accepted by the actors. Our approach is founded on the search for conditions that are the most adapted to the organization of the Veterinary Departments. In the mean time, it is important to put emphasis on the limitation of negative aspects like the fear of being reprimanded, timidity, focalisation on the search for the 'guilty', personal opinions, etc.

Organization of a Veterinary Central Department and the management of food-related alerts

A food-related alert is managed in a Veterinary Central Department (VCD) by relatively few people. Depending on the importance of the alert, the VCD director, the chief inspector and several inspectors are involved. Sometimes, even the secretary is briefed to take telephone calls and to inform victims. So, generally a minimum of two persons and a maximum of six to eight persons are involved depending on the importance of the alert. In this case, we'll concentrate on rather small alerts, with two to four inspectors involved.

The management of an alert results in a file. The content of such a file depends largely on the way of working in a VCD. In certain departments it is very detailed and complete, in others it is rather poor in information. The existence of different kinds of files does not help sharing easily information and experience between the VCD. When an alert is resolved and closed, the file is archived and there is generally no debriefing or retrospective analysis due to the workload of inspectors, the lack of time, the lack of method, culture or organization of debriefing.

Figure 3: Management of an alert



- VCD: Veterinary Central Department
- DGAl (Direction Générale de l'Alimentation) : General Bureau of alimentation
- IVS (Institut de Veille Sanitaire) : Institute of Sanitary Surveillance
- DGCCRF (Direction Générale de la Consommation, la Concurrence et le Repression des Fraudes) : Général Bureau of Consumption, Concurrence and Repression of Frauds.
- DDCCRF : Departmental Bureau
- DDASS: (Direction Départementale des Affaires Sanitaires et Sociales) Departemental Bureau of Sanitary and Social Affaires
- TIAC (Toxi-infection alimentaire collective) : Collective Alimentary Toxi-Infection

Capitalization and sharing of the experience for the Veterinary Central Departments

Methodology

The starting point of our approach is the PER method, *positive experience reflection* [Colardelle 2000]. This method, that is part of the methodology for debriefing and organizational learning, is currently under development within an interest group composed of academics, companies and public bodies [REXAO]. It is applied to different kinds of hazards: natural, technological (industries and transport) and food-related.

The method is illustrated in this paper for the management of food-related hazards by different organisms of control, specially the Veterinary Central Departments. In France there are 96 of such departments and six overseas departments, with represents 102 departments in total. The inspectors of a department have no any direct contact with the inspectors of other departments. There is neither communication nor sharing of experiences. The only way to have an exchange of experiences between inspectors of two different departments is during training sessions or when an inspector is transfered to an other department.

Analysis of the alerts

The method of experience reflection used is composed of four steps: *collection, analysis, validation, sharing.*

- *Collection*: the starting point is the file of the Veterinary Central Department and interviews of the actors by telephone, electronic mail or in person. The extraction of the dossier's information depends largely on the quality of the file. Some Veterinary Central Departments used to keep a logbook of their actions (with is very useful for the second step, the analysis), other Veterinary Central Departments have only a written conclusion that synthesizes the management of the alert and finally some other Veterinary Central Departments have only the official letters and the official microbiological analysis documents.

- *Analysis*: In the collected information we are looking for key events and key decisions. Those key events and key decisions will constitute the particles of experience. We obtain a series of key moments and key decisions. Once each key event is identified, it is detailed into 4 phases of what we call a particle of experience: a situation, an analysis with a decision, an action and its effects. This series of particles of experience constitutes the support for formalization and capitalization of the experience and is named *the string of key events (SKE)* [Colardelle, 2000].

- *Validation*: The parties correct or complete the string of key events and the particles (electronic mail, telephone or meeting). Each person involved in the management of an alert is interviewed and he helps to complete the string of key events with his experience in the form of *hypothetical particles of experience*. The actors are asked what alternative actions they could have done in a similar situation. There are two kinds of possibilities, positive actions and negative actions [Colardelle 2001]. The answers are the reflection of a past experience or an hypothesis of a different action possible. We noticed that the persons who have managed the alert have difficulties to find positive hypothetical particles. Most of the time the alert is managed in a satisfying way with no damage and they think – with ground - that they have taken the right decisions. Persons who are exterior to the service or who have not managed the alert are more likely to propose hypothetical particles of experience.

- *Sharing*: The sharing already exist inside a Veterinary Central Department. It is less common between several Veterinary Central Departments (due to geographical distance, difference in the alert files, workload). Generally, the number of actors who manage the same alert is rather

small (two to four persons, exceptionally more). Those actors are holding regularly meetings with the other persons of the service/office/department and share in this way the same experience related to an alert.

Firstly, the analysis of the alerts is going to be presented to persons outside of the Veterinary Central Department, who we can qualify as 'experts'. We will ask for their remarks and advice. With those supplementary elements we can form the hypothetical particles. Secondly, the whole of the alert's analysis is consulted on a database (the collective memory) with the goal to share the experience.

Since June 2000, corresponding with the beginning of this work, eleven the management of eleven alerts have been analyzed with this method, collaborating with 8 Veterinary Central Departments. The analysis and the validation of those analysis by the actors have validated our approach of representation of the experience of food – related alert's management.

Utilization by the inspectors of the VCD

Important questions have to be answered: How can this knowledge be used? Do we do the analysis in 'real time' situation or after the closure of the alert? Do we analyze every alert or do we choose a limited number of alerts? Do we deal differently with some alerts, some superficially, others more in details?

We decided to analyze only a few interesting alerts a year in each department. The lack of time is the most deciding factor to do so. Also, we suppose that some alerts and their management do not contain enough experience to justify the energy and time to analyze and capitalize. So we are aware that this database can not have a statistical goal - we choose the alerts to analyze - but this is only for pedagogical use and for sharing of relevant experience.

Definition of the collective memory: a database

As support for the collective memory we'll use a database which will be accessible for the VCD by an Intranet connection. A first prototype of a database was developed with Access '97 and presented to some inspectors. Those presentations were followed up by some remarks of the inspectors and those remarks were taken into account.

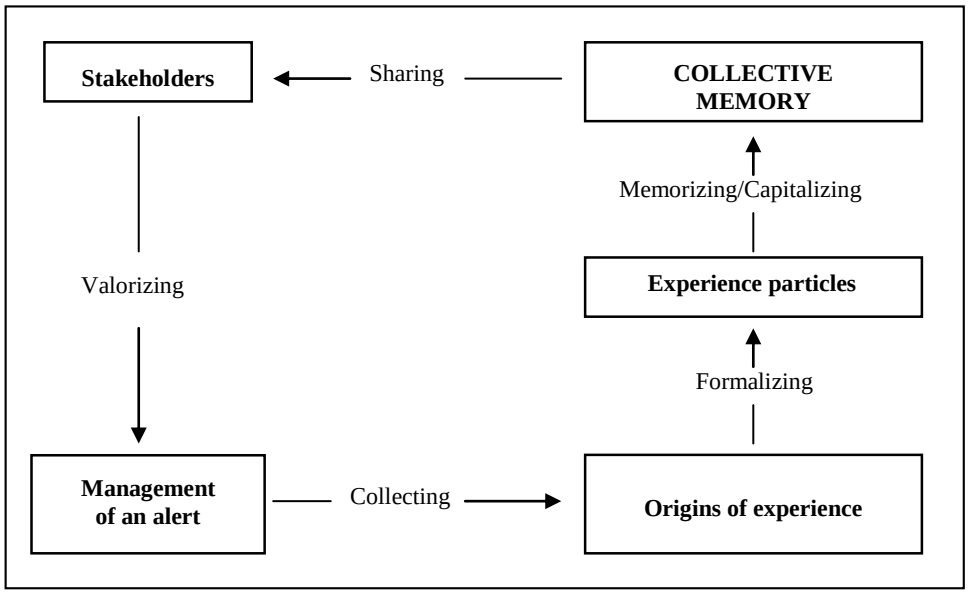
Conclusion

This work has shown the difficulties of the day-to-day management of food-related alerts, the role of the actors, the importance of the individual experiences and the potential of the sharing of those experiences. We are proposing a formalism based on the particles of experience with the goal to compare the management of the alerts and to facilitate the sharing of the knowledge and the development of a collective memory (*Figure 4*).

The alerts that have been analyzed and capitalized in this memory will serve also for the definition of a risk assessment method. This method of hazard analysis will tread the three aspects of hazard: technical, human and organizational.

The following step in this work will be the definition of the collective memory of the alert's management by the Veterinary Central Departments and the procedures to achieve sharing of knowledge.

Figure 4: Experience reflection return and collective memory



References

[Cerisier 1998] Cerisier Y. (1998) *L'impact économique des toxi-infections alimentaires.* Thèse pour le diplôme d'Etat de docteur vétérinaire.

[Colardelle 2000] Colardelle C., Wybo J.L. (2000), *Learning from experience of incidents in public transportation. A new form of experience reflection for organizational learning*, TIEMS conference, Orlando, May 2000.

[Gilbert 2001] Gilbert C. (2001) *Retours d'expérience : le poids des contraintes.* Annales des Mines Responsabilité & Environnement : recherches débats actions. N° 22.

[Kervern 1994] Kervern G.Y. (1994) *Latest advances in Cindynics.* Economica 1994.

[Nicolet 1997] Nicolet J.L. (1997) *Autopsie de quelques grandes catastrophes.* Introduction aux Cindyniques. Ed ESKA, Paris.

[REXAO] Groupement REXAO®. French interest group for debriefing and organizational learning (Retour d'Expérience et Apprentissage Organisationnel). http://www.rexao.org

[Therrien 1998] Therrien M.C. (1998) *Pragmatisme et modèles systémiques pour la compréhension des processus de gestion des feux de forêt : apprentissage et expérience lors d'événements complexes*, Ph.D. thesis, Ecole des Mines de Paris, November 1998.

[Wybo 2001] Wybo J.L., Colardelle C., Poulossier M.P., Cauchois D., *A methodology to share experiences in incident management*, TIEMS conference, Oslo, June 2001.

Authors biographies

- Wim Van Wassenhove is a Ph.D. student at Ecole des Mines de Paris, graduated in agricultural engineering from the University of Gent, Belgium and received a Master of Sciences in Agro-Industrial Management from AGRO Montpellier and E.M Lyon.

- Dr. Jean-Luc Wybo graduated in engineering from the Institute for Applied Sciences in Lyon and received a Master degree and a Ph.D. from the University of Nice. He is the Director of a research laboratory in risk management (Pôle Cindyniques) at Ecole des Mines de Paris and the Executive Editor of IJEM (International Journal of Emergency Management, Inderscience Ltd.).